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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/644,774	08/21/2003	Ichiro Yamashita	59516-36pp-15876.009.	6930

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EXAMINER

MOHAMED, ABDEL A

ART UNIT PAPER NUMBER

1654

DATE MAILED: 09/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/644,774

Applicant(s)

YAMASHITA, ICHIRO

Examiner

Abdel A. Mohamed

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 June 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 20-24 and 26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 20-24 and 26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

ACKNOWLEDGMENT OF AMENDMENT, REMARKS, STATUS OF THE CLAIMS AND APPLICATION

1. The amendment, remarks and the replacement of Figure 1 filed 06/23/06 are acknowledged, entered and considered. In view of Applicant's request claim 25 has been canceled. Claims 1, 20-24 and 26 are now pending in the application. The objections to the drawings and the rejections under 35 U.S.C. 112, second paragraph and 35 U.S.C. 112, first paragraph are withdrawn in view of Applicant's amendment, remarks and cancellation of claim filed 06/23/06. However, the rejection under 35 U.S.C. 103(a) over the prior art of record is maintained for the reasons discussed in the previous Office action.

ARGUMENTS ARE NOT PERSUASIVE

CLAIMS REJECTION-35 U.S.C. § 103(a)

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 20-24 and 26 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Douglas et al (Inorg. Chem., Vol. 39, pp. 1828-1830, 2000) taken with Yang et al (Biochem. J., Vol. 338, pp. 615-618, 1999).

Applicant's arguments filed 06/23/06 have been fully considered but they are not persuasive. Applicant has argued that the Examiner has admitted that Douglas fails to teach or suggest the use of a buffer solution such as HEPES for adjusting the pH. However, the Examiner alleges that the combination of Yang, which discloses the use of Tris and Good's buffer including HEPES and that buffer catalyze the autooxidation, in view of the disclosure of Douglas, renders claims 1, 20-24 and 26 of the invention obvious. Further, Applicant states that the secondary reference of Yang suggests that no buffer is preferable so as to improve the oxidation rate and the pH is set to pH 7 and accordingly, it is out of the range of 8.0-8.8 recited in claim 1 of the present invention is unpersuasive.

Contrary to Applicant's arguments as discussed in the previous Office action, the primary reference of Douglas et al discloses a method for producing a cobalt-protein complex wherein the protein is apoferritin by preparing a solution including Co^{2+} ions, adjusting the solution to pH 8.5 unbuffered by using pH stat (i.e., by adding NaOH to make the pH at 8.5), which overlaps with the claimed ranges of 8.0 to 8.8 and thereby adding an oxidizing agent such as H_2O_2 to said solution to withstand temperature up to 70°C . The reference also teaches that cobalt can be accumulated as a cobalt oxyhydroxide ($\text{CoO}(\text{OH})$) core with assistance of H_2O_2 oxidation (See e.g., Introduction,

Results and Discussion, Conclusion and Figures 1-3) as directed to claims 1, 20-24 and 26.

Although, the primary reference clearly teaches the production of cobalt-apoferritin complex containing cobalt particles, however, the Examiner acknowledges that the primary reference of Douglas et al differs from claims 1, 20-24 and 26 in not teaching the use of a buffer solution such as HEPES for adjusting the pH. Nevertheless, the secondary reference of Yang et al teaches the use of Tris and Good's buffer including HEPES for emphasizing the importance of using proper experimental conditions when investigating the iron oxidation properties of ferritin (See e.g., Introduction). Further, the secondary reference shows on Figures 1 and 4, page 616, left column, and under effects of buffers on Fe(II) autoxidation that buffers demonstrate Fe(II) oxidation kinetics in the presence or absence of ferritin compared with pH stat solutions wherein the HEPES buffer at pH 7 itself inhibits oxidation as disclosed on Figure 1, trace C. Hence, the reference of Yang et al clearly teaches that buffers catalyze the autooxidation. Thus, it is within the ordinary skill of the art to which this invention pertains to employ buffers such as HEPES (design of choice), which are widely known to the art and widely employed in general (preferred) by Yang et al for adjusting the pH.

Further, it is well known in the art to maintain the pH constant by using a buffer of interest such as HEPES. Thus, it will be obvious to one of ordinary skill in the art to use HEPES because HEPES has a pK of 7.5 and the secondary reference of Yang et al teaches that HEPES is the best at pH 7. Hence, one of ordinary skill in the art at the

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time the invention was made would have been motivated to use HEPES for the intended purpose of adjusting the pH because as stated above it is a design choice. Therefore, the teachings of the secondary reference of Yang et al which discloses the use of a buffer such as HEPES for adjusting the pH, are known or suggested in the art, as seen in the secondary reference, and including such features (i.e., buffers such as HEPES) into the method for producing a cobalt-apoferritin complex containing cobalt particles of the primary reference, would have been obvious to one of ordinary skill in the art to obtain the known and recognized functions and advantages thereof for the intended purpose of producing cobalt-protein complex.

Therefore, in view of the above, the combined teachings of the prior art clearly makes *prima facie* obvious a method for producing a cobalt-protein complex such as cobalt-apoferritin complex comprising the steps of preparing a solution including Co^{2+} ions, a protein, and HEPES buffer solution having a pH of 8-8.8 and adding an oxidizing agent such as H_2O_2 and thereby making the protein contain particles composed of cobalt and performed at the claimed temperatures. Thus, it is made obvious by the combined teachings of the prior art since the instantly claimed invention which falls within the scope of the prior art teachings would have been obvious because as held in host of cases including *Ex parte Harris*, 748 O.G. 586; *In re Rosselete*, 146 USPQ 183; *In re Burgess*, 149 USPQ 355 and as exemplified by *In re Betz*, "the test of obviousness is not express suggestion of the claimed invention in any and all of the references but rather what the references taken collectively would suggest to those of ordinary skill in the art presumed to be familiar with them".

ACTION IS FINAL

3. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

CONCLUSION AND FUTURE CORRESPONDANCE

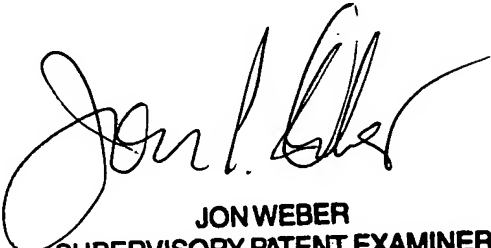
4. No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Abdel A. Mohamed whose telephone number is (571) 272 0955. The examiner can normally be reached on First Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tsang Cecilia can be reached on (571) 272 0562. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



JON WEBER
SUPERVISORY PATENT EXAMINER

AAM Mohamed/AAM
August 29, 2006